

STUDIES ON THE NEMATODES PARASITES OF ARGENTINE CRICETID RODENTS

NEMATODES PARASITOS DE ROEDORES CRICETIDAE DE LA ARGENTINA

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ABSTRACT

This paper studies two nematodes collected from Cricetidae during a study on argentinean parasitological fauna, i.e.: *Nematomystes rodentiphilus* Sutton, Chabaud & Durette-Desset, 1980 (Ascaridida-Aspidoderinae) and *Protospirura numidica criceticola* Quentin, Karimi & Rodríguez de Almeida, 1968 (Spirurida-Spiruridae), found parasitizing unrecorded hosts to date, *Scapteromys aquaticus* Thomas, and *Oxymycterus rufus* (Desmarest) from different localities in Argentina.

These findings increase the host list for studied nematodes, for which to date, only Neotropical cricetid rodents are known, giving us more details concerning rodents parasitic fauna, their digenea having been studied by Sutton (1983) and Sutton & Lunaschi (*in press*). For both nematode species, additional data are given, concerning morphology, dimensions, localization and an analysis on host distribution.

KEYWORDS: Nematoda, Morphology, Ascaridida, Spirurida, Rodents, Argentina.

RESUMEN

Este trabajo estudia dos nematodos colectados de Cricetidae durante un estudio sobre fauna parasitológica argentina, se tratan dos especies de nemátodos ya conocidos, *Nematomystes rodentiphilus* Sutton, Chabaud y Durette-Desset, 1980 (Ascaridida-Aspidoderidae) y *Protospirura numidica criceticola* Quentin, Karimi y Rodríguez de Almeida, 1968 (Spirurida-Spiruridae), hallados parasitando hospedadores no registrados a la fecha, los cricétidos *Scapteromys aquaticus* Thomas, o "rata de agua" y *Oxymycterus rufus* (Desmarest) "hocicudo". Estos hallazgos incrementan la lista de hospedadores conocidos los nemátodo estudiados, la que hasta el momento sólo incluye cricétidos, y para los cuales han sido estudiados ya los digeneos (Sutton, 1983) y Sutton y Lunaschi (*in press*). Para ambas especies de nemátodos se entregaron datos adicionales relacionados con la morfología, dimensiones, localización y un análisis sobre la distribución de los hospedadores.

PALABRAS CLAVES: Nematoda, Morfología, Ascaridida, Spirurida, Rodentia, Argentina.

INTRODUCTION

This paper undergoes the study of two nematodes *Nematomystes rodentiphilus* Sutton, *et al.*, 1980 (Ascaridida-Aspidoderidae-Lauroiinae) and *Protospirura numidica criceticola* Quentin, *et al.*, 1968 (Spirurida-Spiruridae),

found parasitizing unrecorded hosts to date i.e. *Scapteromys aquaticus* Thomas captured in Playa Bagliardi, 30 km from La Plata, Buenos Aires, and *Oxymycterus rufus* (Desmarest) caught in a brushy area, close to the water, in the Parana's river Delta.

From the same hosts, Sutton (1983) and Sutton & Lunaschi (*in press*) have studied the digenean fauna as part of a series dedicated to the study of Argentina's parasitological fauna.

Both referred species are known as part of the Neotropical nematofauna but parasiting other cricetids. Complementary data are given con-

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cerning morphology, dimensions, localization and host distribution.

MATERIAL AND METHODS

Nematodes were collected by the author, from freshly killed hosts, fixed in boiling water and stored in 70% alcohol. Specimens were prepared for study in temporary wet mounts, first in water and progressively in lactophenol. *En face* preparations were made by cutting the cephalic region by hand using a piece of a razor blade. In the descriptions, measurements are quoted as the range with measurements given by other authors in parentheses and are in millimetres.

Hosts were captured with Sherman traps, in brushy areas with close relation to water. *Scapteromys aquaticus* between wild irises, in Balneario Bagliardi, 30 Km from La Plata (200 metres from the shore) and in the Parana's river Delta and *Oxymycterus rufus* only in the second place mentioned.

Specimens were deposited in the Helminthological Collection of the La Plata's Museum, Argentina (MLP).

Identification of hosts follows Cabrera, (1961.)

RESULTS

Nematomytes rodentiphilus Sutton,
Chabaud and Durette-Desset, 1980.
(Figs.1-12)

HOSTS: 1) *Scapteromys aquaticus* Thomas and 2) *Oxymycterus rufus* (Desmarest)

OTHER HOSTS: *Oxymycterus misionalis* Sandborn, from arroyo Zaimán, Misiones, Argentina.

LOCATION: caecum and large intestine; a coparasite of *Levinseniella (Monarhenos) cruzi* Travassos, 1920 in *Scapteromys aquaticus*.

MATERIAL EXAMINED: 1) from *Scapteromys aquaticus* col Helm., MLP n° 2206 D, other material 2184 D, 2187 D 2205 D, 2) from *Oxymycterus rufus*, col. Helm. MLP n° 838 D, 1224 D, 1226 D, 1233 D.

LOCALITY: 1) Playa Bagliardi (57° 05' W and 34° 52' S) Partido de Berisso, and Talavera Island,

Km100, Partido de Campana, Buenos Aires Province. 2) Talavera Island, Km 100, Partido de Campana, both Province of Buenos Aires.

REDESCRIPTION: measurements in mm (range), between brackets those given by Sutton *et al.* (1980).

Rather small nematodes, white when alive. Male slightly smaller than female. Mouth surrounded by three well developed lips with the anterior margin formed by two or three lobes, axially protuberant. Each lip is prolonged backwardly in a complex structure formed by six plaques, a big central one, posteriorly rounded and two smaller lateral ones, which are rectangular and inserted on one side, close to bucal margin and on the other, against lateral border of central plaque. These plaques are continued back and sidewardly by a transparent membranous structure, posteriorly truncated (Fig. 2-4).

Lips, plaques and membranous structures as a whole, are separated from the rest of the body by a postlabial groove. (Fig. 2-3)

Dorsal lip bigger than lateroventral ones. Cephalic disk with 4 cephalic and 2 externo lateral labial papillae, and 2 amphids posterior to these, close to cephalic groove.

MALE: n= 5.

Smaller than female, 5.377-6.084 long [3.52-4.032] and 0.150-0.180 [0.126-0.270] wide. Deirids, nervous ring and excretory pore 0.051-0.064; 0.204 and 0.291 from apex. Oesophagus claviform, with conspicuous valvular apparatus, 0.451-0.522 [0.570-0.864] long; pharynx 0.051-0.060 long. Posterior extremity tapering gradually, with caudal appendage 0.041-0.064 [0.072-0.100] long, distally rounded. Ventral surface with genital sucker, rounded with thick border 0.060 x 0.052 [0.072-0.050] in diameter, 0.046 [0.030-0.050] from cloacal aperture and 14 pairs of papillae, with following distribution: 2 pairs anterior and one pair lateral to genital sucker; two pairs between genital sucker and cloaca and nine pairs postcloacal. (Fig. 9). Phasmids close to last pair of papillae. Cloaca 0.21 - 0.30 from tip of tail. Tail 0.07 - 0.09 [0.07-0.10]. Spicules big and identical heavily chitinized, slightly curved, 0.26-0.35 [0.48 -0.63] long. Gubernaculum subtriangular in frontal view, 0.07 - 0.09 [0.11-0.13] long.

FEMALE: n= 6.

5.18-8.09 [1.73-5.7] long and 0.12-0.25 [0.11-0.31] wide. Deirids, nervous ring and

excretory pore at 0.05-0.07; 0.16-0.25 and 0.27 - 0.33 from apex. Oesophagus 0.46-0.57 [0.48-0.71] long. (Fig.8). Pharynx 0.08. Amphidelphic, vulva at 1.39-1.73 [2.02-2.89] from apex; can be everted, (Fig.11). Anus at 0.46-0.65 [0.24-0.43] from cauda. Tail with blunt ending. (Fig.12). Eggs big, sub-elliptical without ornamentation 0.064-0.076 [0.060-0.080] long and 0.039-0.048 [0.040-0.050] wide, without embryo when laid.

Sutton *et al.*, (1980) described *Nematomystes rodentiphilus* from the caecum of another Neotropical cricetid, i.e.: *Oxymycterus misionalis* Sandborn, captured in a brushy area, close to a small stream from the province of Misiones, (Northern Argentina).

The genus *Oxymycterus* includes within its normal range of habitats, swamps, marshes, grasslands, brushy areas, woodlands and forests, and *Scapteromys* that is a semiacquatic rodent, occupies marshy places and frequently inundated areas (Nowak *et al.*, 1983). Hosts studied in this occasion have all been captured in habitats with close relation to water. Although to date, no data is available concerning the biology of this nematode, it becomes clear that it's under these special ecological surroundings that it takes place, suggesting that host - parasite specificity is strongly influenced by ecological factors.

This finding gives us a larger view of this species geographical distribution and host list, to date belonging to a monospecific genus, describing and measuring structures overlooked in original description and adding drawings that complete it's understanding.

Protospirura numidica criceticola Quentin,
Karimi and Rodriguez de Almeida, 1968
(Figs. 13-18)

HOST: *Scapteromys aquaticus* Thomas.

LOCATION: stomach and small intestine (new localization)

OTHER HOSTS: stomachs of *Akodon azarae* *azarae* (Fischer); *A. boliviensis* Meyen; *A. jelskii* (Thomas); *Bolomys lasiurus* (Lund, 1819); *Calomys callosus* (Rengger, 1830) and *Oryzomys nigripes* (Desmarest, 1819) (experimental).

MATERIAL EXAMINED: 2 _ and 4 _ col. Helm. MLP, n° 2206 C.(1_ y 1_) y n° 2212 B (4 _ y 1_).

LOCALITY: Balneario Bagliardi (57° 05' W and 34° 52 S) Partido de Berisso, Buenos Aires, Argentina.

MEASUREMENTS: (indicated in mm) range,

between brackets those given by Quentin *et al.*, (1968) first, and second those by Sutton, (1989) in other hosts.

MALE: n=2.

LENGTH: 29.50 [24.5] and [15.76-23.40]; width: 0.54-0.65 [0.60] and [0.36-0.48]; deirids-apex: 0.24-0.26 [0.25] and [0.20-0.23]; nervous ring-apex: 0.48 [0.38] and [0.34-0.41]; excretory pore-apex: 0.56-0.61 [0.53] and [0.48-0.56]; muscular oesophagus: 0.30 [0.37] and [0.13-0.38]; glandular oesophagus: 6.55-6.78 [3.85] and [3.13-3.84]; Pharynx laterally compressed, length: 0.12 [0.12] and [0.06]; head diameter: 0.13-0.14 [not given] [0.09]; central lip lobule: 0.04 high by 0.05 wide; cloaca-posterior extremity: 0.46 [0.33] and [0.27-0.31] (Fig.16); Right spicule: 1.60 [1.25] and [1.16-1.37]; left spicule: 0.55 [0.47] [0.34-0.48]; gubernaculum: 0.20 [0.08] [0.10-0.13] (Fig. 17); Bursa: 2.7[-] [-] long, with 10 pairs of papillae, four precloacal and six postcloacal and one papillae situated in centre of anterior cloacal margin. Phasmids close to last pair of papillae, (Fig.16).

FEMALE: n= 5.

LENGTH: 52.00 - 65.00 [50.0] [15.28-30.41]; width: 0.85-1.45 [0.76] [0.40-0.57]; deirids-apex: 0.32-0.33 [0.26] and [0.17-0.22]; nervous ring-apex: 0.58-0.67 [0.46] and [0.26-0.40]; excretory pore-apex: 0.67-0.76 [0.57] and [0.36-0.56]; muscular oesophagus: 0.50-0.55 [0.37] [0.25-0.40]; glandular oesophagus: 7.8-9.4 [5.6] [2.7-3.76]; length of pharynx: 0.18-0.23 [0.17] and [-]; head diameter between anphids: 0.13-0.25 [-] [0.10]; vulva-cauda: 36.0 [21.0] and [5.93-10.95]; anus-cauda: 0.41-0.62[-] and [0.22-0.61]; eggs: 0.058-0.055 x 0.035- 0.040 [0.045 x 0.033] and [0.33-0.37 x 0.37-0.56], with embryo when laid.

DISCUSSION

Protospirura numidica Seurat, 1914, is a widespread species of nematode and may be found present in all major habitats from the vegetated dunes of the Great Salt Lake Desert at 4200 feet to the alpine tundra at 11500 feet (Crook *et al.*, 1964). The subspecies *P. n. criceticola* was described by Quentin *et al.* (1968) upon specimens found parasiting cricetids from Brazil, in order to separate them from the species created by Seurat (1914) based on morphological, geo-

graphical and ecological differences, and including in it, all the north american helminths named as *Protospirura numidica* parasiting different mammal species, mainly rodents.

This subspecies has been found in the stomachs of several Neotropical species of cricetids i.e.: *Bolomys lasiurus* (Lund, 1839) = *Zygodontomys lasiurus* and *Calomys callosus* (Rengger, 1830) by Quentin *et al.* (1968) and in *Akodon azarae azarae* (Fisher), *A. boliviensis* Meyen and *A. jelskii* (Thomas) by Sutton (1989).

Cricetids are ubiquitous animals, and an analysis of habitats occupied by those species mentioned above, indicates that, with the exception of *Akodon jelskii*, all have been found to include within their normal habitats, areas in close or relatively close relation to water, so stated by Reig (1964), Olrog & Lucero (1980), Nowak & Paradiso (1983), Mares *et al.* (1989), Massosia *et al.* (1964) and Redford *et al.* (1992).

In order to find an explanation to such an array of hosts for this nematode, which includes the Scapteromiini, Akodontiini and Phyllotiini tribes, and to which a new Scapteromiini must be added, i.e. *Scapteromys aquaticus* Thomas, it must be taken in account that the latter has also been captured in areas with characteristics referred above. This fact seems to aid *Protospirura numidica criceticola* to conclude its life cycle in an ample variety of habitats evidently under the basis of ecological factors, more than in reference to precise host species, adding further evidence to that one stated by Quentin *et al.* (1968).

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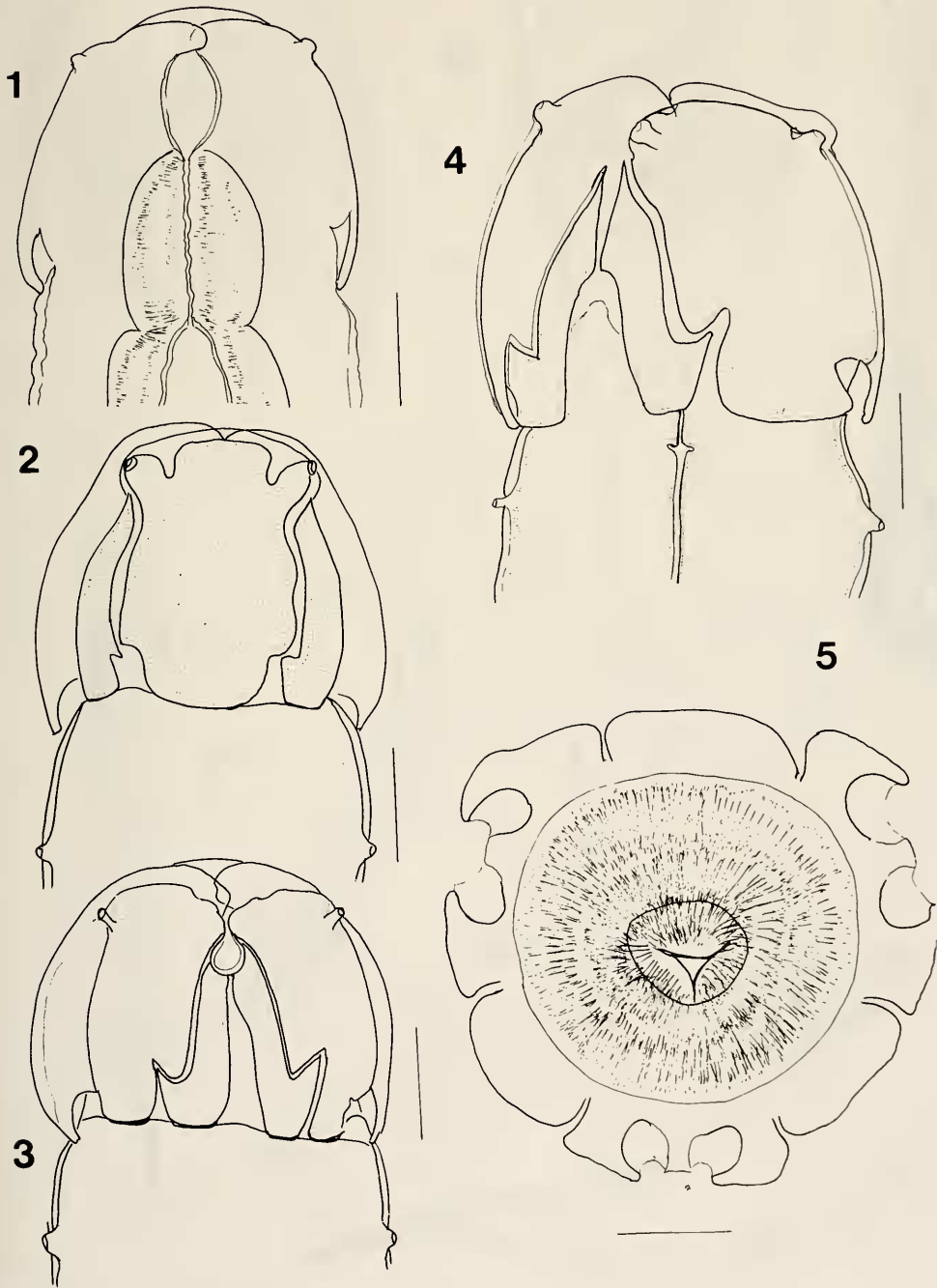
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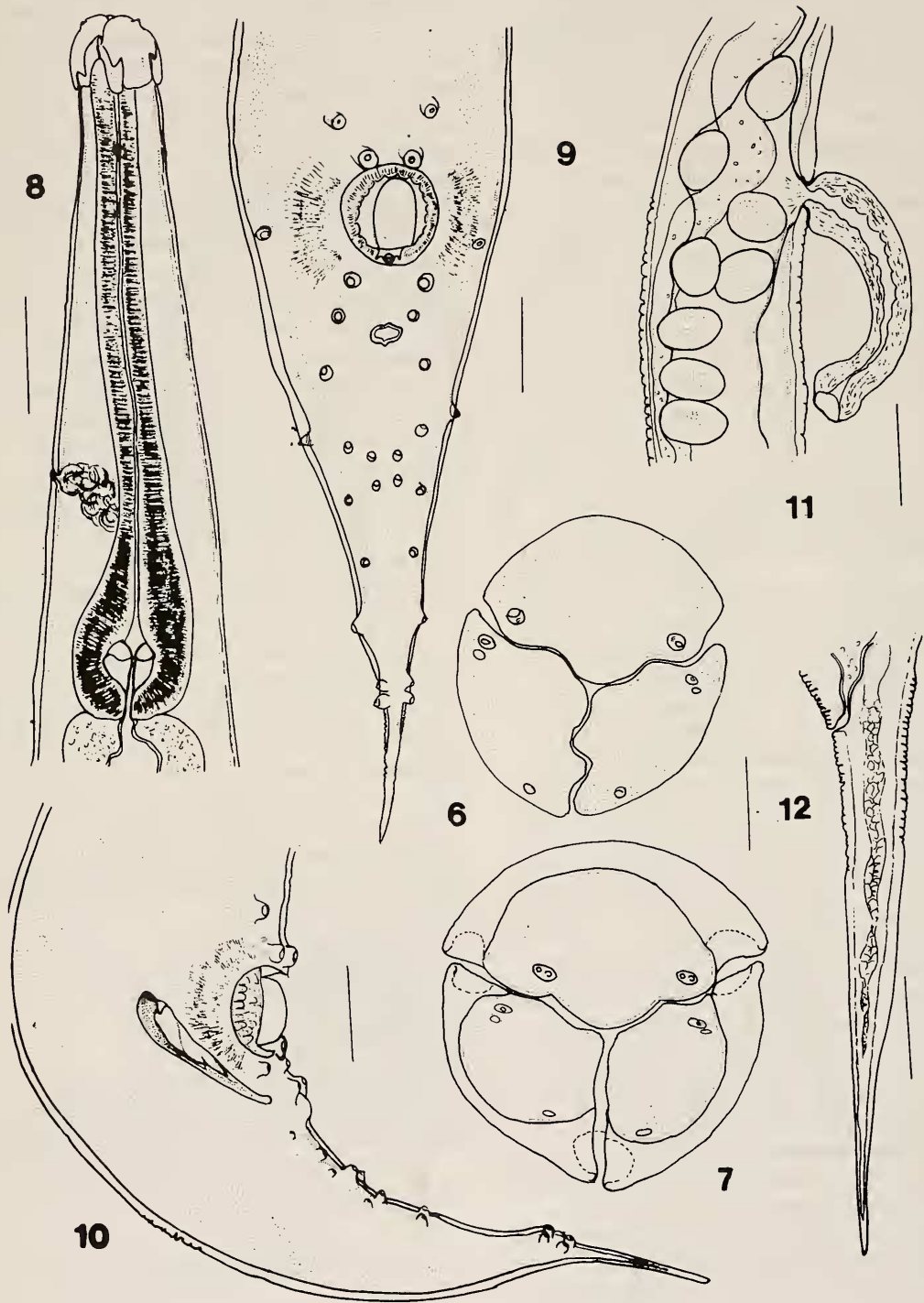
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Nematomystes rodentiphilus Sutton *et al.*, 1980:

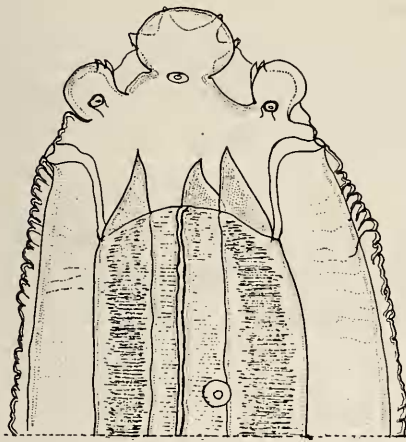
FIG. 1. female, anterior extremity, ventral general view; FIG. 2. male, ventral view; FIG. 3. idem, ventral view; FIG. 4. female, sublateral view; FIG. 5. idem, apical view at level of pharynx.

Scale bars: 1 to 7= 20 μ m; 9-10= 50 μ m; 8-11-12= 100 μ m. ^

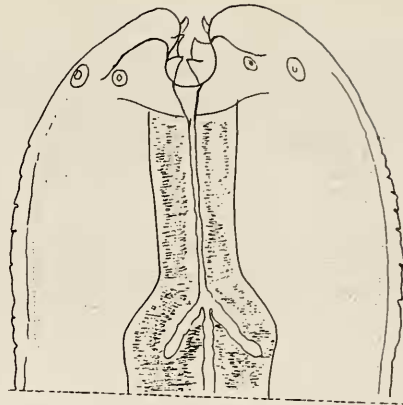


Nematomystes rodentiphilus Sutton *et al.*, 1980:

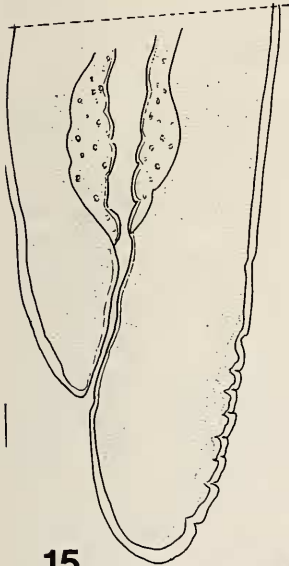
FIGS. 6-7, *idem* apical view; FIG. 8 *idem*, anterior extremity lateral view; FIG. 9 male, bursa ventral view; FIG. 10. *idem*, right lateral view; FIG. 11. female, vulva and eveted vagina; FIG. 12. *idem*, cauda lateral view. Scale bars: 1 to 7= 20 μ m; 9-10= 50 μ m; 8-11-12= 100 μ m.



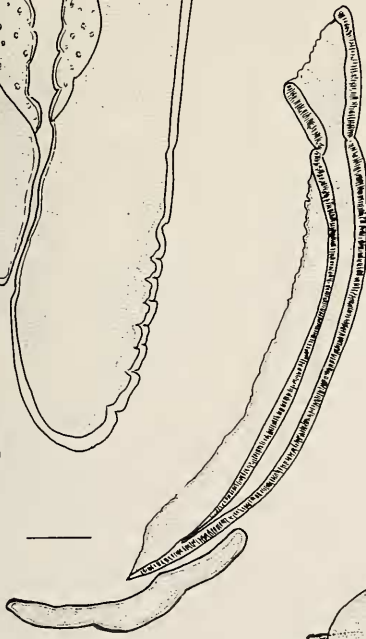
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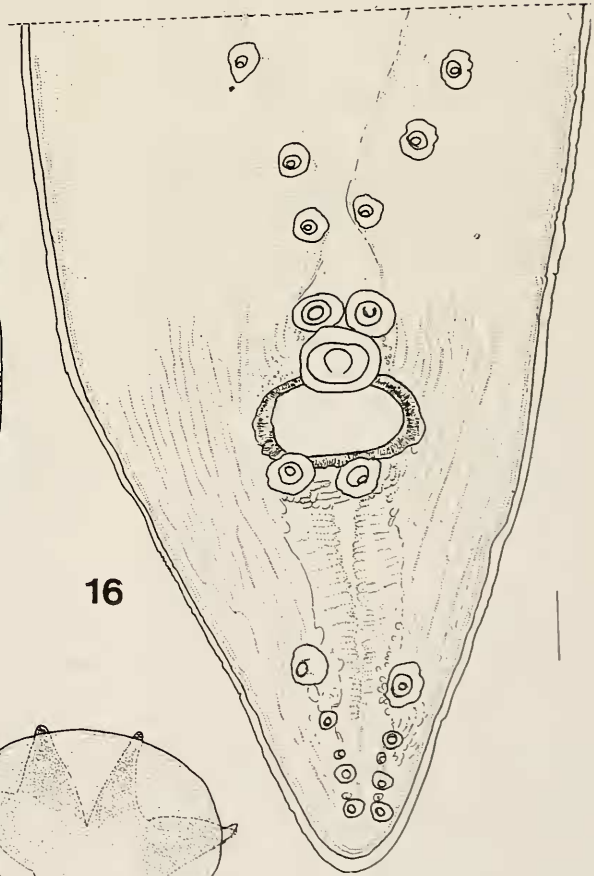
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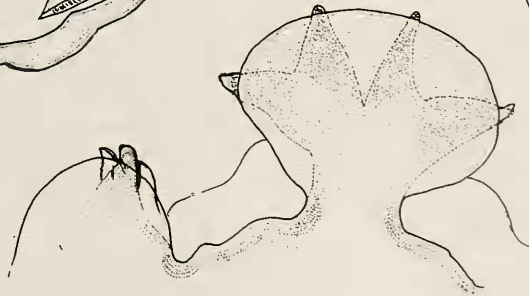
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Protospirura numidica criceticola Quentin, et al., 1968:

FIG. 13. female, anterior extremity ventral view; FIG. 14. idem lateral view; FIG. 15. idem, cauda, left lateral view; FIG. 16. male bursa ventral view; FIG. 17. small spicule and gubernaculum, left lateral view; FIG. 18. female, labial lobules.

Scale bars: 13-14-16-17= 50 μ m; 15= 100 μ m; 18= 10 μ m.